

Two new species of *Macrophya* Dahlbom (Hymenoptera: Tenthredinidae) with a key to species of the *Macrophya annulitibia* group from China

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Abstract: In the genus *Macrophya*, the *annulitibia* group is proposed to include five species from China, India and Japan. Two new species belonging to this species group are described from China: *Macrophya shengi* Li & Chu sp. nov. from Sichuan and *Macrophya xinan* Li & Liu sp. nov. from Tibet and Sichuan. Descriptions and illustrations are given to separate them from the other species of the *annulitibia* group. A key to all known species of the *annulitibia* group from China is provided. Type specimens are deposited in the Insect Collection of Central South University of Forestry and Technology, Changsha, Hunan, China.

Key words: Symphyta; Tenthredinoidea; taxonomy; sawflies

中国钩瓣叶蜂属两新种及 *M. annulitibia* 种团中国种类检索表（膜翅目：叶蜂科）

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摘要：记述中国钩瓣叶蜂属 *Macrophya* Dahlbom 斑胫钩瓣叶蜂种团 *Macrophya annulitibia* group 2 新种：盛氏钩瓣叶蜂 *Macrophya shengi* Li & Chu sp. nov. 和西南钩瓣叶蜂 *Macrophya xinan* Li & Liu sp. nov.；简要讨论了 *M. annulitibia* group 的主要鉴别特征和种类分布概况，编制了 *M. annulitibia* group 中国已知种类分种检索表。新种模式标本保存于中南林业科技大学昆虫模式标本室。

关键词：广腰亚目；叶蜂总科；分类；叶蜂

Introduction

Macrophya Dahlbom, 1835 is the third largest genus in the Tenthredininae and the fourth largest in the Tenthredinidae. A total of 262 species have been described worldwide through 2014 (Li & Wei 2013; Li *et al.* 2013a, b, c, 2014a, b), including 126 species recorded from China (Wei *et al.* 2006, 2013; Taeger *et al.* 2010; Zhao *et al.* 2010a, b; Zhao & Wei 2011; Zhu *et al.* 2012; Li *et al.* 2012, 2013a, b, c, 2014a, b; Li & Wei 2012, 2013; Wu *et al.* 2012).

The *Macrophya annulitibia* group is represented by five species worldwide: *M. annulitibia* Takeuchi, 1933 (Takeuchi, 1933), *M. gopeshwari* Saini, Singh, Singh & Singh,

Accepted 19 December 2014. Published 25 March 2015

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1986 (Saini *et al.*, 1986), *M. naga* Saini & Vasu, 1997 (Saini & Vasu, 1997), *M. parapompilina* Wei & Nie, 1999 (Wei & Nie, 1999) and *M. pompilina* Malaise, 1945 (Malaise, 1945). In China, three species of these have been recorded: *M. annulitibia* Takeuchi, 1933, *M. parapompilina* Wei & Nie, 1999 and *M. pompilina* Malaise, 1945. *Macrophya annulitibia* is known also from Japan, North Korea and East Siberia and *M. gopeshwari* and *M. naga* are from India. These species are similar in general morphology and they form a distinct species group. In this paper, the *M. annulitibia* group is defined, two new species from Sichuan and Tibet of China are described and a key to all known species of the *M. annulitibia* group from China is provided.

Material and methods

Specimens were examined with a Motic-SMZ-168 dissection microscope. Adult images were taken with a Nikon D700 digital camera and a series of images were montaged using Helicon Focus (©HeliconSoft). All images were further processed with Adobe Photoshop CS 11.0.

Morphological descriptions of new species are based on the holotype. The terminology of genitalia follows Ross (1945) and that of general morphology follows Viitasaari (2002). For a few terms (e.g. middle fovea and lateral fovea), we follow Takeuchi (1952).

Specimens examined during this study are deposited in the Insect Collection of Central South University of Forestry and Technology, Changsha, China including all holotypes and paratypes of the two new species.

Taxonomy

Macrophya annulitibia species group

Diagnosis. Body mainly black, without metallic tinge; antenna slender, black; posterior margin of metepimeron concave to some extent, appendage differentiated, but without basin and long hairs; anal cell of hind wing without petiole; serrulae of lancet in female protruding in different degrees; valviceps in male transverse and with a platform at the top, without ergot.

The *Macrophya annulitibia* group includes three known species from China and two new species from Sichuan and Tibet are described here. They can be separated using the following key.

Key to the known species of the *Macrophya annulitibia* group from China

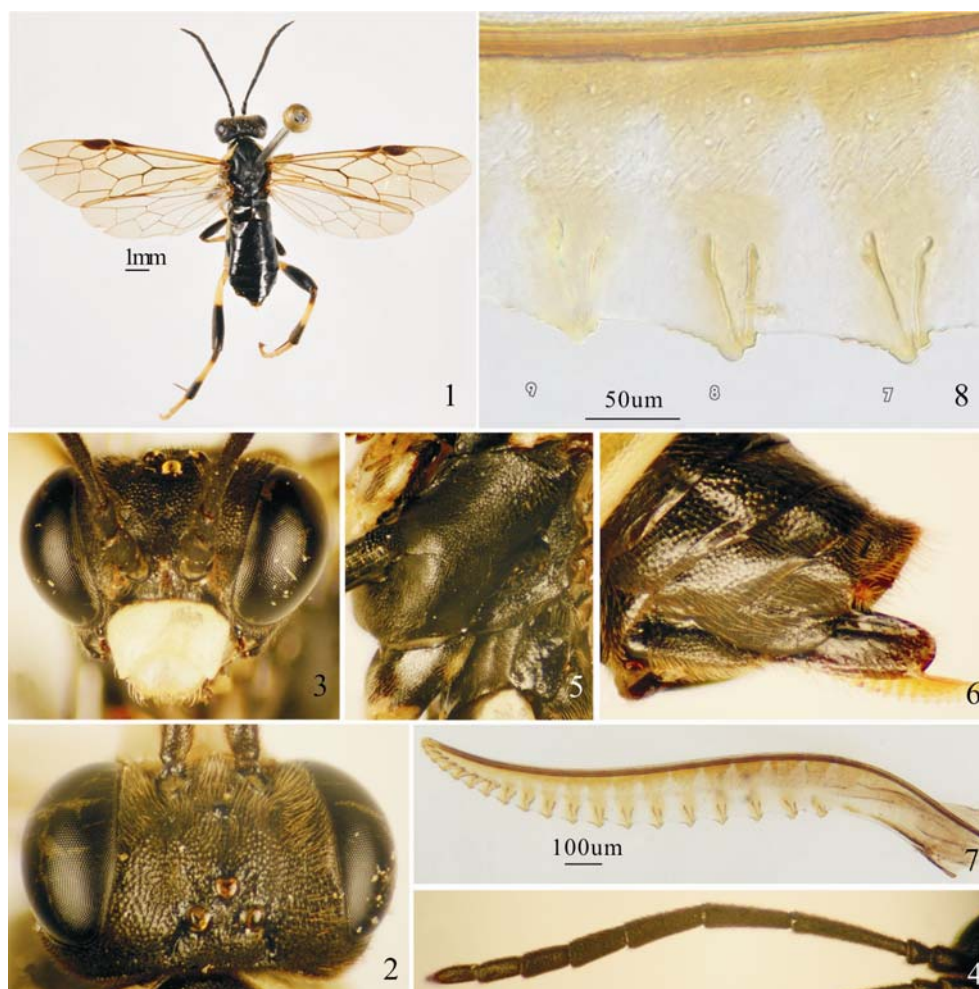
1. Hind tibia entirely black; fore wing with distinct, transverse smoky band below stigma.....2
- Hind tibia partly yellow; fore wing hyaline, without smoky band below stigma.....3
2. Antenna partly white, antennomere 3 approximately 1.13 times as long as antennomere 4; posterior margin of metepimeron slightly extended downward and concave, appendage narrow and small; hind femur with white band dorsally. Burma; China (Sichuan, Yunnan)..... *M. pompilina*
- Antenna entirely black, antennomere 3 approximately 1.37 times as long as antennomere 4; posterior margin of metepimeron extended downward, strongly concave, appendage wide and large; hind femur entirely black. China (Gansu, Shanxi, Henan, Hubei, Sichuan, Yunnan)..... *M. parapompilina*

3. Posterior corners of pronotum entirely black; (postocellar area about 2.5 times broader than long; hind tarsomere 1 entirely black). North Korea; Japan, East Siberia; China (Heilongjiang, Jilin, Liaoning, Gansu, Henan, Sichuan).....*M. annulitibia*
- . Posterior corners of pronotum with distinct yellowish maculae, otherwise similar to the former..... 4
4. Mesoscutellum entirely yellow; posterior margin of metepimeron clearly extended downward and concave, appendage long and narrow, containing some minute punctures; fore coxa largely yellow, with small black maculae; basal half of middle femur yellow, apical half black; basal 4/7 of hind femur yellow, apical 3/7 black; hind tarsus largely yellow, base of hind tarsomere 1 black; apical 1/7 of fore wing with a subrounded, smoky macula. China (Tibet, Sichuan).....*M. xinan* sp. nov.
- . Mesoscutellum entirely black; posterior margin of metepimeron extended downward and concave, appendage broad, containing some large punctures; fore coxa largely black, with small yellow maculae; basal 1/3 of middle and hind femora yellow, apical 2/3 black; hind tarsus entirely yellow; fore wing without smoky macula. China (Sichuan)..... *M. shengi* sp. nov.

1. ***Macrophya shengi* Li & Chu sp. nov.** (Figs. 1–8)

Female. Body length 8 mm. Body black, following parts yellow: palps largely, basal 1/2 of mandibles, labrum, clypeus, lateral corners of posterior margin of pronotum, anterior margin of tegula, narrow posterior margin of abdominal tergum 1, apical margin of abdominal tergum 10, ventral side and small macula on outer side of fore coxa, apex and narrow stripes on outer side of middle coxa, apex and oval macula on outer side of base of hind coxa, all trochanters, anterior sides of fore femur and tibia, about basal 1/3 of middle femur, middle tibia except for base and apex, basal 1/3 of hind femur, middle 3/7 of hind tibia, fore and middle tarsi large, hind tarsus, fore and middle tibial spurs, and hind tibial spurs large. Body hairs pale yellowish brown, setae on sheath pale black brown. Wings subhyaline, without smoky macula, stigma and veins black brown (Fig. 1).

Dorsum of head feebly shiny, frons minutely and densely punctured, interspaces between punctures with fine microsculpture (Fig. 2); labrum and clypeus shiny, labrum with very sparse and shallow punctures, clypeus with minute punctures, but microsculpture distinct. Mesoscutum with punctures shallower and denser than punctures on head, interspaces with fine microsculpture; mesoscutellum not shiny, with dense and minute punctures, apex with some large punctures; mesoscutellar appendage with distinct punctures and microsculpture; metascutellum with some large and shallow punctures; mesepisternum densely punctured, interspaces with fine microsculpture; anepimeron rugosely punctured and wrinkled; anterior margin of katepimeron strongly shiny, without puncture or microsculpture, posterior part of katepimeron with some shallow punctures and distinct microsculpture; metepisternum with fine punctures and microsculpture; metepimeron shiny, most parts smooth, upper corner of dorsal margin with coarse punctures; posterior margin of metepimeron extended downward and concave, appendage broad, containing some large punctures, nearly smooth (Fig. 5). All abdominal terga feebly shiny, lateral sides of tergum 1 with some fine punctures, center nearly smooth; base of other abdominal terga with sparse and shallow punctures, microsculpture fine but distinct. Hind coxa and outer side of hind femur with minute and dense punctures, smooth interspaces narrow, feebly shiny. Surface of sheath coriaceous, with very fine punctures and microsculpture.



Figures 1–8. *Macrophya shengi* Li & Chu sp. nov., ♀, paratype. 1. Adult, dorsal view; 2. Head, dorsal view; 3. Head, front view; 4. Antenna; 5. Mesopleuron and metapleuron; 6. Ovipositor sheath, lateral view; 7. Lancet; 8. 7th–9th serrulae of lancet.

Middle of labrum elevated, anterior margin truncate; clypeus nearly flat, about 2 times broader than long, base slightly broader than distance between lower corner of eyes; lateral sides distinctly convergent forwards, anterior margin incised to approximately 1/3 length of clypeus, lateral lobes short and obtuse (Fig. 3); malar space 0.4 times as long as the diameter of middle ocellus; middle of frons slightly depressed, about as high as top of eyes in lateral view; middle fovea shallow but distinct; lateral foveae small, furrow-like; interocellar furrow distinct, postocellar furrow indistinct; POL : OOL : OCL = 4 : 14 : 10; postocellar area slightly elevated, 3 times broader than long, lateral furrows shallow and clearly divergent backwards; head strongly narrowed behind eyes in dorsal view, occipital carina complete. Antenna slender, 1.3 times longer than head and thorax together, as long as abdomen; antennomere 2, 1.2 times as long as broad, antennomere 3, 1.5 times as long as antennomere 4 (22 : 15), 0.8 times as long as antennomeres 4 and 5 combined (22 : 29), subapical antennomeres weakly compressed

and inflated (Fig. 4). Mesoscutellum roundly elevated, with low peak and without carina, as high as top of mesoscutum; mesoscutellar appendage with distinct middle carina; metascutellum with low and short middle carina, mesopleuron and metapleuron as in Fig. 5; dorsal-posterior platform of mesepimeron as broad as diameter of middle ocellus; distance between cenchri 2.5 times breadth of cenchrus. Inner tibial spur of hind leg 0.7 times length of hind tarsomere 1 (27 : 40); hind tarsomere 1 slender, as long as following 4 tarsomeres together; claw with inner tooth shorter than outer tooth. Ovipositor sheath distinctly shorter than hind tarsomere 1 (3 : 4), apical sheath slightly longer than basal sheath (3 : 2), apical margin roundish in lateral view (Fig. 6). Fore wing with crossvein 1cu-a joining cell 1M at basal 1/3, crossvein 2r-rs joining cell 2Rs at apical 1/3, cell 2Rs as long as cell 1Rs; petiole of anal cell in fore wing about 2.2 times longer than crossvein 2r-m and about 1.6 times longer than crossvein 1cu-a; anal cell of hind wing without petiole. Lancet with 19 serrulae (Fig. 7), middle serrulae strongly protruding and each with 1–2 proximal and 5–6 distal teeth, subbasal teeth small, annular spine bands narrow, with sparse pilosity; 7th–9th serrulae as in Fig. 8.

Male unknown.

Holotype. ♀, **China**, Sichuan, Tianquan County, Mt. Labahe, 12-VII-2003, 1800–2000 m, Wei XIAO. **Paratypes.** 7♀, **China**, Sichuan, Tianquan County, Mt. Labahe, 12-VII-2003, 1800–2000 m, Wei XIAO & Weixing LIU.

Etymology. This new species is named after Mr. Maoling SHENG, who gave many sawfly specimens to our laboratory.

Remarks. The new species is similar to *M. annulitibia* Takeuchi, 1933, but differs from the latter in having the lateral corners of the posterior margin of pronotum with distinct yellow maculae, the postocellar area about three times broader than long, middle 3/7 of the hind tibia yellowish white, the hind tarsomere 1 entirely yellowish white, and the cell 2Rs in the fore wing as long as the cell 1Rs. In *M. annulitibia*, the pronotum is entirely black, the postocellar area is about 1.6 times broader than long, the middle 1/3 of the hind tibia is yellowish white, the hind tarsomere 1 is entirely black, and the cell 2Rs in the fore wing is slightly shorter than the cell 1Rs.

Distribution. China (Sichuan).

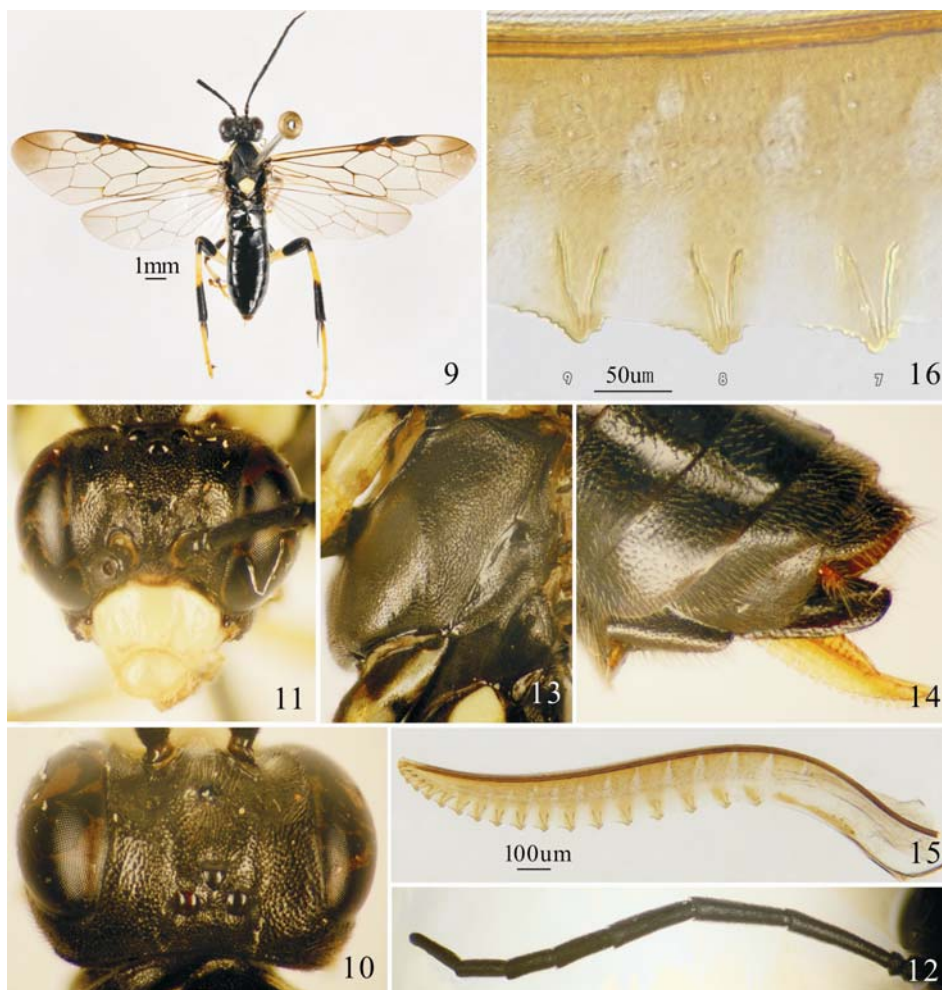
2. *Macrophya xinan* Li & Liu sp. nov. (Figs. 9–16)

Female. Body length 9.5 mm. Body black, following parts luminous yellow: palps largely, basal of mandibles largely, labrum, clypeus, broad lateral corners of pronotum, apical 1/2 of tegula, mesoscutellum, lateral sides of metascutellum, apical margin of abdominal tergum 10, fore coxa except for black base, apex and basal macula on outer side of middle coxa, apex and oval macula on outer side of hind coxa, all trochanters, basal 1/2 and anterior side of fore femur, basal 1/2 of middle femur, basal 4/7 of hind femur, fore tibia except for basal margin on outer side and apex, middle tibia except for base and apex, middle 2/5 of hind tibia, fore tarsus, middle and hind tarsomeres 1 large. Body hairs pale yellowish brown, setae on sheath pale black brown. Wings largely hyaline, apical 1/7 of fore wing with a subrounded smoky macula, stigma black brown, veins largely black (Fig. 9).

Dorsum of head feebly shiny, frons minutely and densely punctured, smooth interspaces narrower than diameter of puncture (Fig. 10); labrum and clypeus shiny, labrum nearly smooth, without distinct punctures and microsculpture; clypeus with some shallow punctures,

microsculpture fine but distinct. Thorax not shiny, punctures on mesonotum smaller and denser than punctures on head, with fine microsculpture; mesoscutellum feebly shiny, apex with some shallow punctures, surrounding areas of mesoscutellum with slightly dense and minute punctures; mesoscutellar appendage and metascutellum with distinct punctures and microsculpture; mesepisternum feebly shiny, densely punctured, without smooth interspaces; anepimeron not shiny, rugosely punctured and wrinkled; anterior margin of katepimeron strongly shiny, without puncture or microsculpture, middle of katepimeron with distinct small punctures, posterior part of katepimeron with dense and coarse punctures; metepisternum not shiny, with fine punctures and microsculpture; metepimeron shiny, mostly smooth, middle with some minute punctures, upper corner of dorsal margin with coarse punctures; posterior margin of metepimeron clearly extended downward and concave, appendage long and narrow, containing some minute punctures (Fig. 13). Abdominal tergum 1 shiny, lateral sides with some minute punctures, center with fine microsculpture; other abdominal terga feebly shiny, with fine and sparse punctures, microsculpture fine but distinct. Hind coxa and outer side of hind femur with minute and dense punctures, narrow smooth interspaces distinct, feebly shiny. Surface of sheath coriaceous, with fine punctures and microsculpture.

Labrum slightly elevated, anterior margin truncate; clypeus nearly flat, about 2 times broader than long, base broader than distance between lower corner of eyes; lateral sides distinctly convergent forwards, anterior margin incised to approximately 1/3 length of clypeus, lateral lobes obtuse (Fig. 11); malar space 0.5 times as long as diameter of middle ocellus; middle of frons slightly depressed, slightly higher than top of eyes in lateral view; middle fovea shallow but distinct; lateral foveae small, furrow-like; interocellar furrow distinct, postocellar furrow indistinct; POL : OOL : OCL = 5 : 13 : 10; postocellar area slightly elevated, 2.5 times broader than long, lateral furrows slightly deep and clearly divergent backwards; head strongly narrowed behind eyes in dorsal view, occipital carina complete. Antenna slender, 1.7 times longer than head and thorax together, 1.1 times longer than abdomen; antennomere 2 as long as broad, antennomere 3, 1.2 times as long as antennomere 4 (6 : 5), 0.6 times as long as antennomeres 4 and 5 combined (12 : 19), subapical antennomeres not inflated and weakly compressed (Fig. 12). Mesoscutellum distinctly elevated, with tapered peak and with indistinct carina, distinctly higher than top of mesonotum in lateral view; mesoscutellar appendage with acute middle carina; metascutellum with low and short middle carina, mesopleuron and metapleuron as in Fig. 13; middle of mesepisternum distinctly elevated and broadly carinate; dorsal-posterior platform of mesepimeron as broad as diameter of middle ocellus; distance between cenchri 2.5 times as broad as cenchrus. Inner tibial spur of hind leg 0.6 times as long as hind tarsomere 1 (7 : 12); hind tarsomere 1 slender, 1.1 times longer than following 4 tarsomeres together (8 : 7); claw with inner tooth shorter than outer tooth. Ovipositor sheath distinctly shorter than hind tarsomere 1 (35 : 48), apical sheath slightly longer than basal sheath (4 : 3), apical margin narrowly round in lateral view (Fig. 14). Fore wing with crossvein 1cu-a joining cell 1M at basal 1/3, crossvein 2r-rs joining cell 2Rs at apical 2/5, cell 2Rs longer than cell 1Rs; petiole of anal cell in the fore wing about 2.4 times longer than crossvein 2r-m and about 2 times longer than crossvein 1cu-a; anal cell of the hind wing without petiole. Lancet with 18 serrulae (Fig. 15), middle serrulae strongly protruding and each with 1–2 proximal and 5–6 distal teeth, subbasal teeth small, annular spine bands narrow, with sparse pilosity; 7th–9th serrulae as in Fig. 16.



Figures 9–16. *Macrophya xinan* Li & Liu sp. nov., ♀, holotype. 9. Adult, dorsal view; 10. Head, dorsal view; 11. Head, front view; 12. Antenna; 13. Mesopleuron and metapleuron; 14. Ovipositor sheath, lateral view; 15. Lancet; 16. 7th–9th serrulae of lancet.

Male unknown.

Holotype. ♀, **China**, Tibet, Milin County, Mt. Gongbu, 29°14' N, 94°14' E, 13-VI-2009, 2948 m, Zejian LI. **Paratypes.** 1♀, **China**, Sichuan, Mt. Emei, Xixiangchi, 29°32' N, 103°20' E, 02-VII-2006, 2000 m, Hu ZHOU; 1♀, Tibet, Motuo County, 60 K, 29°42' N, 95°36' E, 18-VI-2009, 2937 m, Gengyun NIU; 1♀, Tibet, Motuo County, 60 K, 29°42' N, 95°36' E, 20-VI-2009, 2998 m, Gengyun NIU; 1♀, Sichuan, Mt. Emei, Leidongping, 29°546' N, 103°327' E, 05-VII-2009, 2350 m, Yihai ZHONG; 1♀, Sichuan, Mt. Emei, Leidongping, 29°32' N, 103°20' E, 28-VI-2011, 2425 m, Chaoyang ZHU and Jigang JIANG, CSCS11109.

Etymology. The species epithet “xinan” means “southwest” in Chinese. The distribution of the new species, Sichuan and Tibet, belongs to the southwest part of China. It is a noun in apposition.

Remarks. The new species is similar to *M. annulitibia* Takeuchi, 1933, but differs from the latter in having the lateral corners of the pronotum, the basal 1/2 of the tegula, the

mesoscutellum and the lateral sides of the metascutellum luminous yellow, the postocellar area about 2.5 times broader than long, the mesoscutellum distinctly elevated, with a tapered peak and with an indistinct carina, distinctly higher than the top of the mesoscutum in lateral view, the basal 4/7 of the hind femur luminous yellow, and the apical 3/7 black, the middle 2/5 of the hind tibia luminous yellow, the hind tarsomere 1 largely luminous yellow, basally black, the apical 1/7 of the fore wing with a subrounded smoky macula, the petiole of the anal cell in the forewing about 2.4 times longer than the crossvein 2r-m and about 2 times longer than the crossvein 1cu-a, and the cell 2Rs longer than the cell 1Rs. In *M. annulitibia*, the pronotum, tegula, mesoscutellum and metascutellum are entirely black, the postocellar area is about 2 times broader than long, the mesoscutellum is roundly elevated, without apex and carina, and slightly lower than top of the mesoscutum in lateral view, the basal 1/3 of the hind femur, and the middle 1/3 of the hind tibia are yellow, the hind tarsomere 1 is entirely black, the wings are hyaline, with the apex of the fore wing without smoky macula, the petiole of the anal cell of the forewing is about 2 times longer than the crossvein 2r-m and about 1.4 times longer than the crossvein 1cu-a, and the cell 2Rs is slightly shorter than the cell 1Rs.

Distribution. China (Tibet, Sichuan).

Acknowledgements

We would like to thank Dr. Gengyun NIU and Dr. Yihai ZHONG for collecting the type specimens of the new species. This research was supported by the National Natural Science Foundation of China (31201736, 31172142).

References

- Li ZJ, Dai HY & Wei MC. 2013a. A new species of *Macrophya* Dahlbom (Hymenoptera: Tenthredinidae) with a key to species of *Macrophya coxalis* group from China. *Entomotaxonomia*, 35(3): 211–217.
- Li ZJ, Heng XM & Wei MC. 2012. A new species of *Macrophya* Dahlbom (Hymenoptera: Tenthredinidae) with a key to species of *Macrophya planata* group. *Entomotaxonomia*, 34(2): 423–428.
- Li ZJ, Huang NT & Wei MC. 2013b. Three new species of *Macrophya sibirica* group (Hymenoptera: Tenthredinidae) from China. *Acta Zootaxonomica Sinica*, 38(4): 869–877.
- Li ZJ, Lei Z, Wang JF & Wei MC. 2014a. Three new species of *sanguinolenta*-group of the genus *Macrophya* (Hymenoptera: Tenthredinidae) from China. *Zoological Systematics*, 39(2): 297–308.
- Li ZJ, Liu M & Wei MC. 2014b. Four new species of *sanguinolenta*-group of the genus *Macrophya* (Hymenoptera: Tenthredinidae) from China. *Zoological Systematics*, 39(4): 520–533.
- Li ZJ & Wei MC. 2012. Two new species of *Macrophya imitator* group (Hymenoptera: Tenthredinidae) from China. *Acta Zootaxonomica Sinica*, 37(4): 795–800.
- Li ZJ & Wei MC. 2013. Three new species of *Macrophya coxalis* group (Hymenoptera: Tenthredinidae) from China. *Acta Zootaxonomica Sinica*, 38(4): 831–840.
- Li ZJ, Zhong YH & Wei MC. 2013c. Two new species of *Macrophya sanguinolenta* group (Hymenoptera: Tenthredinidae) from China. *Acta Zootaxonomica Sinica*, 38(1): 124–129.
- Malaise R. 1945. Tenthredinoidea of south-eastern Asia with a general zoogeographical review. *Opuscula Entomologica* (supplement), 4: 1–288.
- Ross HH. 1945. Sawfly genitalia: terminology and study techniques. *Entomological News*, 61(10): 261–268.

- Saini MS, Singh M, Singh D & Singh T. 1986. Four new species, two each of *Athlophorus* and *Macrophya* (Hymenoptera: Tenthredinidae) from India. *Journal of the New York Entomological Society*, 94(1): 62–69.
- Saini MS & Vasu V. 1997. Present position of *Macrophya* Dahlbom from India (Hymenoptera, Tenthredinidae: Tenthredininae). *Journal of Entomological Research*, 21(3): 237–243.
- Taeger A, Blank SM & Liston AD. 2010. World catalog of Symphyta (Hymenoptera). *Zootaxa*, 2580: 1–1064.
- Takeuchi K. 1933. Undescribed sawflies from Japan. *The Transactions of the Kansai Entomological Society*, 4: 17–34.
- Takeuchi K. 1952. *A Generic Classification of the Japanese Tenthredinidae (Hymenoptera: Symphyta)*. Kyoto. 90 pp.
- Wei MC & Nie HY. 1999. New taxa of Tenthredinidae from south slope of Mt. Funiu (Hymenoptera: Tenthredinomorpha: Tenthredinidae). In: Shen X & Pei H (Eds.), *Insects of the Mountains Funiu and Dabie Regions*. China Agricultural Science and Technology Press, Beijing, pp. 102–106.
- Wei MC, Nie HY & Taeger A. 2006. Sawflies (Hymenoptera: Symphyta) of China – checklist and review of research, 505–574. In: Blank SM, Schmidt S & Taeger A (Eds.), *Recent Sawfly Research: Synthesis and Prospects*. Goecke & Evers, Keltern, 704 pp.
- Wei MC, Xu Y & Li ZJ. 2013. Two new species of *Macrophya koreana* subgroup of *Macrophya sanguinolenta* group (Hymenoptera, Tenthredinidae) from China. *Acta Zootaxonomica Sinica*, 38(2): 328–334.
- Wu XY, Xin H, Li ZJ & Wei MC. 2012. Three new species of *Macrophya* Dahlbom from China (Hymenoptera, Tenthredinidae). *Acta Zootaxonomica Sinica*, 37(4): 801–809.
- Viitasaari M. 2002. The Suborder Symphyta of the Hymenoptera In: Viitasaari M (Ed.), *Sawflies (Hymenoptera, Symphyta) I. A review of the suborder, the Western Palaearctic taxa of Xyeloidea and Pamphilioidea*. Tremex, Helsinki, pp. 11–174.
- Zhao F, Li ZJ & Wei MC. 2010a. Two new species of *Macrophya* Dahlbom (Hymenoptera, Tenthredinidae) from China. *Entomotaxonomia*, 32(supplement): 81–87.
- Zhao F, Li ZJ & Wei MC. 2010b. Two new species of *Macrophya* Dahlbom (Hymenoptera, Tenthredinidae) from China with a key to species of the *imitator* group. *Japanese Journal of Systematic Entomology*, 16(2): 265–272.
- Zhao F & Wei MC. 2011. Two new species of *Macrophya* Dahlbom (Hymenoptera, Tenthredinidae) from Shennongjia, China. *Acta Zootaxonomica Sinica*, 36(2): 264–267.
- Zhu X, Li ZJ & Wei MC. 2012. Two new species of *Macrophya* Dahlbom from Shaanxi and Gansu of China (Hymenoptera: Tenthredinidae). *Acta Zootaxonomica Sinica*, 37(1): 165–170.